

Amendments to the Claims

1-18, (non-elected and withdrawn)

19. (currently amended) A method for determining the gas transmission rate through a
~~continuously measuring the diffusion of a gas through a permeable,~~ barrier material
comprising the steps of:

- a) providing a sealable box within which at least a portion of said material is placed;
- b) sealing said material within said box to form a test gas chamber extending from one side of said material and a measurement chamber extending from the opposite side of said material, said measurement chamber encompassing a sealed area of said material sufficient to allow uniform diffusion of said gas through said material;
- c) continuously metering a set quantity of said gas into and out of said test gas chamber by controlling a rough vacuum to determine the concentration of said gas in said test gas chamber as a function of time;
- d) drawing a vacuum in said measurement chamber by a molecular vacuum pump to a final vacuum of at least about 2×10^{-4} Torr;
- e) providing a mass spectrometer in direct valved communication with said measurement chamber; and
- f) determining the transmission of said gas ~~of interest~~ through said material by partial pressure readings of said mass spectrometer.

20 (original) The method of claim 19 further including the step of initially calibrating said mass spectrometer to a national standard indicative of an absolute permeation measurement to establish an absolute gas transmission rate through said barrier material in step (f).

21. (original) The method of claim 20 further including the step of verifying said measurement chamber against leakage at the final vacuum levels of said measurement chamber.

22. (original) The method of claim 21 further including the step of heating said measurement and test gas chambers to a set level whereby the excitation of and the diffusion of said gas into said material is enhanced.

23. (currently amended) The method of claim 20 further including the step of providing a roughing vacuum pump valved into fluid communication with said gas and said test gas chamber and said gas is liquid water in a heated, agitated container connected to said roughing pump, said roughing pump causing water vapor to be supplied to said test gas chamber and said mass spectrometer measuring water vapor concentration diffused into said measurement chamber and ~~said correlating step~~ determining the ability of said material to resist permeation of humidity present under normal operating conditions of said material.

24. (original) The method of claim 21 wherein said material includes a substrate with a plurality of barrier coatings applied to a substrate surface and said gas may comprise any elemental gas or combination thereof.

25. (original) The method of claim 24 wherein said gas has an atomic mass lower than about 50 including oxygen and water vapor and combinations thereof.

26. (currently amended) The method of claim 25 wherein said gas is an inert gas including argon, helium, and combinations thereof.

27. (currently amended) The method of claim 26 wherein said gas is helium and ~~said correlating a correlation step is performed~~ includes the step of establishing a relationship

between the diffusion rate of helium through said material and the diffusion of a gas of interest under study through said material.

28. (original) The method of claim 20 further including the step of supporting said material against excessive deflection into said measurement chamber.